REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated October 4, 2007. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 17 and 21-41 are in consideration in this application. Claims 18-20 are being cancelled without prejudice or disclaimer. Claim 17, 26-29 and 33 is being amended, as set forth above and in the attached marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim Applicants' invention. Claims 34-41 are being added.

All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formality Rejection

Claims 17-25 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. As indicated, the claims are being amended as required by the Examiner. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

Prior Art Rejections

Claims 17-25 were rejected under 35 U.S.C. §102(b) as being anticipated by Article by Kristsson & Rasco ("K&R"). Claims 17-25 were further rejected under 35 U.S.C. §103 (a) as being unpatentable over an article by Bergeron et al. in view of K&R and an article by Van Guldener & Stehouwer (VG&S), and claims 26-33 were rejected over Nielson (US 2002/0182290) in view of K&R, an article by Sharma et al. and an article by Pena-Ramos et al. Applicants have reviewed the above rejections, and hereby respectfully traverse.

The method of treating or preventing a disease comprising administering to an animal a pharmaceutical or nutritional composition comprising an enzyme treated fish protein hydrolysate (FPH) material (i.e., *denaturated, hydrolysed* fish protein made from fish waste unfit for direct human consumption while suitable for the use, such as FPH made from fish

flesh remnants on fish bone frames after filleting (claim 29, [0036]; [0052] pf corresponding US Pub. No. 2007/0142274). In particular, the disease is fatty liver, hypercholestrolemia, or hyperhomocysteinemia (cancelled claims 18-20, now incorporated into claim 17).

Bergeron only uses "*frozen cod filets*" as fish protein (p. 1732, let col. 2nd line from the bottom, i.e., *non-denaturated* fish protein), rather than any "enzyme treated fish protein hydrolysate (FPH) material made from *protein-containing fish material such as* flesh remnants on fish bone frames after filleting (*denaturated and hydrolysed* fish protein; claim 34)" according to the present invention.

As admitted by the Examiner (p. 5, 3rd paragraph of the outstanding Office Action), Bergeron also fails to teach FPH or an enzyme treated FPH. Bergeron suggests that the lipoprotein lipase (LPL) activity is a determinant for the fish-protein induced decrement of in VLDL triglycerides and concomitant rise in HDL cholesterol in rabbits (p. 1736, 2nd col., 2nd paragraph). Bergeron further discusses that a fish protein induced rise in lipoprotein lipase activity may result from an increase in the concentration of apo C-II as cofactor, which is considered important for full activity expression of the LPL. One skilled in the art who is familiar with mechanism for enzymatic reactions would not assume that Bergeron's un-hydrolysed proteins would have the same effect as a fish protein hydrolysate on an enzymatic reaction, even if they came from the same origin/fish. As demonstrated by Example 4 ([0059]-[0061]) in the specification of the present invention, the administration of FPH to rats inhibits the Acyl-CoA:cholesterol transferase (ACAT) to 0.035 nmol/mg/min, which catalyses the reaction in which fatty acyl-CoA is esterified to cholesterol, while un-hydrolysed proteins (i.e., casein) only inhibits the ACAT to 0.05 nmol/mg/min. As such, un-hydrolysed protein does not necessarily deliver the same mechanism and as significant beneficial effect on cholesterol as FPH (Fig. 3).

As commonly known and described in K & R (p. 44, 1st col., 4th and 5th paragraphs, "*each type of food protein has a unique molecular structure that determines its functional properties (...)*", and "*the functional and structural properties of food proteins thus vary tremendously (...)*". Moreover, "*enzymatic hydrolysis of fish proteins generates a mixture of free amino acids, di-, tri-, and oligopeptides, increases the number of polar groups and the solubility of the hydrolysate, and therefore modifies functional characteristics of the proteins, improving their functional characteristics and bioavailability. The choice of substrate and proteases employed and the degree to which the protein is hydrolyzed affect the physicochemical properties of the resulting hydrolysate* (p. 64, 2nd col., 1st paragraph)".

K&R (p. 44, 1st col., 2nd paragraph) only uses FPH in general food formulations or a

general antioxidant (p. 75, 2nd col., 1st paragraph) *"FPH can have an antioxidant potential."*), but not for treating or preventing fatty liver, hypercholestrolemia, or hyperhomocysteinemia recited in claim 17. *K&R has no teaching about such medical applications for fish protein hydrolysates.* VG&S only treats hyper-homocysteineia by folic acid and B6, but not by any FPH.

Since K&R does not teach any medical application for fish protein hydrolysates. From K&R's teachings, one skilled in the art would never arrive at the new medical applications found in the present invention. Since Bergeron's medical applications are related to a native protein and thus a very different material than the present invention, where a denaturated and hydrolysed protein is used, which comprises protein fractions such as smaller peptides and free amino acids. Therefore, one skilled in the art would not assume Bergeron's medical effect of native proteins would be transferable for FPH in K&R.

In addition, the additional effects for the FPH of the present invention are not shown in Bergeron, such as the medical effect on the hyperhomocysteinemia. Therefore, contrary to the Examiner's assertion, one skilled in the art would not arrive at the claimed invention: using an enzyme treated fish protein hydrolysate (FPH) material made from fish flesh remnants to treat or prevent fatty liver, hypercholesterolemia, or hyperhomocysteinemia in animals and humans, based upon the teachings of Bergeron, K& Ro and VG&S.

The method of producing an enzyme treated fish protein hydrolysate (FPH) of the present invention, as now recited in claim 26, comprises steps of: a) hydrolyzing fish flesh remnants, with a solution containing a protease enzyme at a pH in the range of 5.0-8.0 and at a temperature in the range of 40-70°C to yield a hydrolysate; b) raising the temperature of the solution containing said hydrolysate to [[about]] the range of 90-99°C; c) removing an insoluble fraction by **decanting** and filtering to obtain a remaining mixture; d) separating the remaining mixture in a three phase separator into an oil fraction, an emulsion fraction and aqueous fraction; e) isolating and filtering the aqueous fraction through an ultramembrane with a nominal molecular weight limit of 100,000 to obtain ultramembrane filtered fraction ([0054]); and f) spray-drying the ultramembrane filtered fraction to obtain the enzyme treated fish protein hydrolysate.

The invention of claim 33 is directed to a method of treating or preventing atherosclerosis, coronary heart disease, stenosis, thrombosis, myocardial infarction and stroke comprising: producing an enzyme treated fish protein hydrolysate (FPH) by the steps a)-f) of claim 26, and administering to an animal a pharmaceutical or nutritional composition

comprising the enzyme treated fish protein hydrolysate (FPH).

In contrast, Nielson teaches away from the invention by removing liquid containing solutable protein with oil to obtain clean fish bones ([0037]), rather than "removing an insoluble fraction including the fish bone frames from the solution to obtain a remaining mixture in the solution" as the step c) of the present invention. Nielson focuses on the improved processing and application of fish bones, rather than producing a functional fish protein hydrolysate. Nielson simply has no teaching included how the hydrolysate is further processed and what the fish protein hydrolysate might be used for.

K & R (p. 63, 1st col., 2nd paragraph) desludges the slurry by centrifugation or in some cases filtration, rather than decanting. Decanting is a much more gentle process than centrifugation, leading to another separation result than centrifugation in terms of composition. Decanting is also economically more efficient when applied to large volumes since it does not afford larges centrifuges and specialized equipment. This is clearly an advantage of this method. In addition, K & R (p. 64, 1st col., 2nd paragraph) directly filters the hydrolysate after enzyme inactivation through a membrane with specific molecular weight cut-off (arguably ~ step e)), rather than decanting and filtrating an insoluble fraction including the **fish bone frames** from the solution in Step c) and then separating the remaining mixture in a three phase separator in Step d) before treating in an ultra filtration procedure of Step e). In particular, "*this method (of ultra filtration) has, however not found its way into fish protein hydrolysate production.... It is, however, possible that the method could be applied to highly purified and defatted FPH powders*". As such, contrary to the Examiner's assertion, one skilled in the art would be discouraged to combine K & R's step of directly filtering the hydrolysate after enzyme inactivation through a membrane, with the other processing steps. Therefore, one skilled in the art would not be motivated to combine the references as suggested by the Examiner.

Applicants contend that the cited references and their combinations fail to teach or suggest each and every feature of the present invention as recited in independent claims 17, 26 and 33. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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